Claim 1 (currently amended). A thermally-integrated water-gas shift reactor ~~for converting~~ operating to convert reformate gases including carbon monoxide in the presence of steam to form carbon dioxide and water comprising, in combination,

a) a centrally located waste-heat recovery steam generator for the recovery of exothermic reaction heat to generate steam,

b) an outer region defined between inner and outer wall surfaces and extending at least part way about said waste-heat recovery steam generator,

c) packed catalyst located within said outer region, and through which reformate gases flow, all of said catalyst extending only helically and everywhere about the steam generator, the volume between said inner and outer wall surfaces being filled with said packed catalyst, there being flow guide surfaces extending helically adjacent the catalyst between said inner and outer cylindrical surfaces to which said guide surfaces are connected, to direct all gases to flow only helically through the packed catalyst between said inner and outer wall surfaces, and about the generator said catalyst being everywhere separate ~~separated~~ from the flow guide surfaces, the

catalyst located entirely outside and outwardly of the generator, said catalyst being continuous in the helical direction of guided flow about the steam generator located centrally in the reactor, and

d) the outer region being in heat transfer communication with the steam generator and operating to maintain the catalyst within a predetermined temperature range for operation of a water-gas shift reaction producing said exothermic reaction heat.

Claim 2 (previously presented). The combination of claim 1 wherein the waste heat steam generator operates at temperatures in one of the following ranges: 360°F to 450°F, and 385°F to 400°F, that is optimum for conducting the water-gas shift reaction.

Claim 3 (previously presented). The combination of claim 1 wherein said catalyst includes a Cu/Zn catalyst which is contained in volumetric space defined by said outer region.

Claim 4 (previously presented). The combination of claim 3 wherein the boiling water fluid is located proximate the catalyst to heat the catalyst during start-up.

Claim 5 (previously presented). The combination of claim 3 wherein the catalyst extends helically about said waste heat recovery steam generator to transfer heat to the boiling water fluid.

Claim 6 (cancelled).

Claim 7 (previously presented). The combination of claim 1 wherein the flow guide surfaces comprise a helical coil at said space to conduct and increase the velocity of the gases as they flow helically through the catalyst and to enhance the rate of heat transfer to and from the catalyst, said space being between 1 and 2 inches wide to minimize temperature differentials between the outer and inner walls, and wherein the gases have hourly space velocity in the range of 500hr-1 to 2000hr-1.

Claim 8 (previously presented). The combination of claim 1 wherein the catalyst is proximate to said generator to be maintained in one of the following temperature ranges: between 370°F and 550°F, and between 400°F and 450°F.

Claim 9 (previously presented). The combination of claim 3 wherein the space between said wall surfaces is between 1 and 2 inches wide to minimize temperature differentials between the outer and inner wall surfaces.

Claim 10 (previously presented). The combination of claim 3 wherein the catalyst has a helical length characterized in that the gases have an hourly space velocity in the range of 500hr-1 to 2000hr-1.

Claim 11 (previously presented). The combination of claim 1 wherein the waste heat steam generator contains one or more heat transfer conduits that transfer heat from waste heat combustion products to a boiling water fluid in the generator for the purpose of generating steam.

Claim 12 (previously presented). The combination of claim 1 wherein said outer region has an upper level inlet flowing reformate gases into the catalyst, the reformate gases including carbon monoxide, and said region has a lower level outlet, a heat transfer conduit or conduits extending within said vessel and immersed within boiling water contained in said vessel

inwardly of said catalyst bed, said conduit or conduits operable for transfer of heat to the boiling water, for generating steam exiting from said vessel.

Claims 13-15 (cancelled).